I. Executive Summary

a. Project Title: Reduction of Synthetic Pesticides and Fertilizers in Five California Counties—The BIOS/ LFN Strategy.

Applicant Name: Community Alliance with Family Farmers

b. Project Description and Primary Biological/Ecological Objectives

Chemical-based agriculture has been justifiably cited as one of the primary contributors to the decline of aquatic species and habitats in California. As the state's leading organization advocating for sustainable agriculture, the Community Alliance with Family Farmers (CAFF) seeks to eliminate the need for these chemicals, particularly organophosphates, by promoting an agriculture that works in harmony with natural processes and encourages the creation of habitat for a rich diversity of species.

CAFF operates two programs in five counties in the San Joaquin and Sacramento River watersheds that directly motivate farmers to reduce their use of synthetic chemicals and adopt biological farming practices. The Biologically Integrated Orchard Systems (BIOS) program provides technical information to farmers interested in dramatically reducing or eliminating pesticide use. At the same time, our Lighthouse Farm Network (LFN) provides a forum for farmers to share experiences so they can confidently proceed in the elimination of toxic chemicals. It is time to widen our sphere of influence to include many more farmers. We ask CALFED to fund the continued expansion of our technical assistance programs, BIOS and LFN, in our five target counties.

c. Approach, Tasks and Schedules

CAFF will continue the collaborative, peer involvement approach that has been successful for BIOS and LFN since their inception in 1993. The tasks outlined in this proposal, however, will emphasize a conversion focus in both programs. We are prepared to move out of the demonstration and technique development phase and into a phase of facilitating a widespread conversion to biological farming strategies. Directly linking BIOS and LFN through the five tasks outlined in our proposal will involve intensive use of media to reach the broadest number of farmers and agriculture professionals in our target counties and in the larger agricultural community. We propose a three-year program focused on almond growers but also reaching conventional growers of other crops through LFN and our media campaign.

d. Justification for Project and Funding by CALFED

CALFED has made a $660,000 investment in the BIOS approach to farm management. This investment has allowed CAFF to establish conclusively that BIOS methodologies for pesticide elimination actually work. But the next step, widespread acceptance and application of biological techniques, must still be taken. CAFF's work will lead to the massive reduction in aquatic habitat stressors from agricultural sources.

e. Budget Costs and Third Party Impacts

We are asking CALFED for a total of $1,681,056 over three years: $472,425 in year 1, $803,181 in year 2, and $405,450 in year 3. Reduction or elimination of the targeted chemicals will result in enhanced habitat for a large variety of aquatic species. In addition, the general quality of the physical environment for people will be enhanced because of the greater diversity of species, the elimination of dangerous chemicals from surface and ground water and cleaner air.

f. Applicant Qualifications

With funding from a variety of leading public and private environmental organizations, including CALFED, CAFF has been operating a variety of farmer-support programs for the last twenty years. In recent years, CAFF has been recognized for our environmental work through BIOS and LFN. Our staff and volunteers have been participants in some of the major alternative farming initiatives in the state of California. With over 30 professionals on staff, CAFF has consistently led the farming community in promoting and adopting sustainable practices, and we enjoy excellent working relationships with institutions such as United States Department of Agriculture, University of California Cooperative Extension, the United States Environmental Protection Agency and many others.

g. Monitoring and Data Evaluation

CAFF will engage the California Institute for Rural Studies (CIRS) to monitor reductions in pesticide use in the subject counties. The State of California will provide the pesticide use reporting data base for the counties, and readings will be taken at the beginning, during and at the end of the project time period. Grower surveys and other media-based research techniques will also be used to document pest reduction.

h. Local Support/Coordination with other Programs/Compatibility with CALFED Objectives

CAFF has spent the last four years winning the confidence and support of local farmers, farm organizations (including the Farm Bureau), local community leaders and elected officials, and a wide variety of state agency personnel in the target counties. Many of these people have participated in LFN meetings as speakers and in a variety of BIOS farm tours and events. The success of BIOS and similar programs have resulted in a reassessment of the assumptions of chemical agriculture. Support of this program will promote CALFED's ecological restoration objectives and the regeneration of our precious water and habitat resources.

I-006278

II. Title Page

Reduction of Synthetic Pesticides and Fertilizers in Five California Counties—The BIOS/LFN Strategy.

Community Alliance with Family Farmers' proposal to The CALFED Bay–Delta Program

July 1997

Principal Investigators: Ernest Phinney, Executive Director and Jill Klein, Associate Director of Agriculture and Communities.

Contact Information: CAFF, P.O. Box 363, Davis, CA 95617, Phone: 916.756.8518, Fax: 916.756.7857, General E-mail: caff@caff.org, Web site: <www.caff.org>.

Type of Organization and Tax Status: Non-Profit, 501 (c)(3)

Tax Identification Number: 94-2914745

Technical Contact Person: Jill Klein, **Financial Contact Person:** Ernest Phinney.

Participants/Collaborators in Implementation: Commity Alliance with Family Farmers and California Insititute for Rural Studies (CIRS).

RFP Project Group Type: Other Services.

III. Project Description

A. Project Description and Approach

The Community Alliance with Family Farmers (CAFF) is a major player in the movement to reduce the use of toxic pesticides and to promote sustainable agriculture in California, the richest agricultural producer in the world. Guided by our mission to build a movement of rural and urban people who foster family-scale agriculture that cares for the land, sustains local economies, and promotes social justice, our organization involves thousands of farmers, scientists, policy makers, agricultural leaders and members of the public. Our programs demonstrate the benefits of ecological farming and advocate for their widespread adoption by providing direct technical assistance and peer support to farmers who want to adopt biologically-based farming techniques.

For nearly four years, our Biologically Integrated Orchard Systems (BIOS) program has served as a successful demonstration of the effectiveness of ecological methods in the reduction of pesticides and synthetic fertilizers. We currently work with almond farmers in five counties (Colusa, Madera, Merced, San Joaquin and Stanislaus) in the San Joaquin and Sacramento River watersheds. Our management teams of local experts work with enrolled growers to develop customized farm management plans based on the use of seeded cover crops, elimination of broad spectrum pesticides, and other environmentally friendly practices. Implementation of these plans is possible through on-going technical support in the form of regular field days, annual farm visits, a systematic monitoring program, and a quarterly program newsletter.

We have documented the elimination of organophosphate pesticides and reduced use of chemical fertilizers and herbicides on our participating farms, and we have seen signs that an interest in non-chemical practices is spreading to neighboring orchards. But the transformation has only just begun. The technologies and techniques BIOS advocates must be put into widespread practice if the environmental benefits are to be substantial and permanent.

The next step in the BIOS strategy is to build a community of farmers and agricultural professionals in the counties where BIOS is active, which regularly meets to share information about the technology and long-term profitability of unconventional farming systems. CAFF's Lighthouse Farm Network (LFN), a program of monthly educational meetings for farmers in fifteen locations throughout the state, provides a forum for information sharing and mutual support. We believe that active outreach through the LFN is the key to building a new consensus for and widespread adoption of biological practices among farmers who are now totally dependent on chemical techniques.

In the five counties where BIOS is now working, participants have enrolled approximately 1% of the total almond acreage in the program. Finding success in their demonstration blocks, these same growers have extended the methods throughout their farms, totalling approximately 10% of the almond acreage in these counties. We are requesting funding from CALFED to help us achieve our goal of changing farming practices on the other 90% of almond acreage in these five counties by continuing and expanding our efforts.

Over the next three years, we plan to:

1. Implement an intensive media campaign to enlist mainstream farmers in CAFF's pesticide reduction programs.
2. Continue to coordinate BIOS in San Joaquin, Madera and Colusa Counties through the 1999 growing season.
3. Oversee the transition of these three projects to local leadership starting in the fall of 1999.
4. Use the Lighthouse Farm Network to offer consistent technical support to conventional farmers and BIOS growers.

I-006280

B. Geographic Boundaries of Project

This project will operate in both the Sacramento and San Joaquin River watersheds. Counties to be served include: Stanislaus, Merced, Madera, San Joaquin, and Colusa. The implementation of our public education and demonstration projects will reach into other counties, particularly those with significant almond acreage, including Kern, Fresno, Glenn, and Kings counties.

C. Expected Benefits

This project targets the Instream Aquatic Habitat. The primary stressor to be addressed by this project is water quality from agricultural, non-point source contaminants and increased nutrient input.

Primary Benefit: This project will reduce the use of pesticides that have been shown to degrade water quality. Since 1993, farmers enrolled in the BIOS program have cut by 90% their use of diazinon, a priority pollutant known to degrade water quality. We expect to see the continued decrease of diazinon and other organophosphate insecticides over the course of our project. In the five counties where BIOS is working, enrolled orchards now account for approximately 1% of the total almond acreage, though grower surveys indicate that they are managing approximately 10% of the almond acreage with BIOS methods.

Secondary Benefits: This project will also:

- reduce the use of synthetic nitrogen by enrolled almond growers by 50%.
- be applied to other crops that use priority pollutants known to degrade water quality. Currently, BIOS-type projects have been adopted in grapes, cotton and prunes. We expect to see an overall reduction in priority pollutants in all five counties.
- stimulate the research and extension community to find new ways to reduce pesticide use. This impact can be measured by increases in funding for research and extension of biologically balanced farm practices by institutions such as the California Almond Board and the University of California.

Third Party Benefits: BIOS, and related activities coordinated through the LFN, will improve air and water quality in target counties. It will increase on-farm habitat a range of agriculturally beneficial species, and bring an overall net improvement in quality of life for rural communities.

D. Background and Biological/Technical Justification

This project will capitalize on the success of our current programs, which provide farmers with the technical assistance they need to reduce water quality and ecosystem stressors.

The organophosphate insecticides diazinon, methidathion (Supracide) and chlorpyrifos (Lorsban) are commonly used by almond farmers in the San Joaquin River and Sacramento River Watersheds during the winter months. These chemicals are used to control overwintering populations of Peach Twig Borer (PTB), a primary economic pest of almonds. Pease, *et al.* found that almonds use about 22% of the diazinon and 21% of the methidathion applied annually in California.[1]

Farm chemicals that leach or flow off farms become contaminants that can cause acute or chronic toxicity of aquatic organisms including fish. Since 1988, a consistent pattern of contaminant loading from the orchard spray diazinon, along with other insecticides, has been documented by state and federal agencies. In a 1993 study by the U.S. Geological Survey, well defined pulses of diazinon moved down the Sacramento and San Joaquin Rivers following rainfall events, in concentrations above the National Academy of Sciences-recommended guidelines for the protection of aquatic life in surface water. This loading has also been documented to cause widespread acute toxicity to invertebrate indicator species in every tested watershed where orchards were present. In a recent

[1] "Pesticide Use in California: Strategies for Reducing Environmental Health Impacts," California Policy Seminar, April 1996, Vol. 8, #4.

report,[2] DPR found that diazinon exceeded the California Department of Fish and Game's suggested criterion of acute toxicity for the protection of freshwater life in about 56% of the samples. Nutrient runoff in the form of synthetic nitrogen is also considered an ecosystem stressor. This nitrogen can be associated with low dissolved oxygen and can degrade the water as well as creating fish migration barriers. The BIOS approach addresses at their sources the major environmental stressors inherent in conventional almond orchard management practices.

BIOS versus Alternative Approaches: In contrast, BIOS substitutes diazinon with a whole-systems approach to controlling pests such as PTB. Our methods include the use of seeded cover crops, elimination of broad spectrum pesticides, augmentative releases of beneficial insects, reduction in synthetic fertilizers and applications of compost. BIOS growers are actively promoting healthy soils which have increased water holding capacity and healthy trees which can resist pest outbreaks. BIOS enhances the entire ecosystem by improving the ecology of the whole farm, as shown through indicators such as earthworms in the soil and increased wildlife on farms.

Accomplishments: BIOS began in Merced County in 1993, and expanded to Stanislaus in 1994. BIOS grew again in 1996 with Category III funding for projects in Colusa, San Joaquin and Madera Counties, serving five of the seven most productive almond growing counties of California. Over the last four years, BIOS has invested $1.1 million to extend information and hands-on experience to almond growers in these five counties. BIOS currently provides technical assistance to over 70 almond farmers to encourage pesticide reduction and pollution prevention in the San Joaquin and Colusa Basin watersheds. We also work with growers' pest control advisors (PCAs), who are an essential element for maximizing our impact because each PCA typically helps manage at least 5,000 acres.

There are nearly 10,000 acres now under BIOS management techniques. 90% of enrolled BIOS growers have eliminated the use of insecticide dormant sprays, and their use of organophosphate insecticides has decreased by 71%. Since joining the BIOS program, over 75% of the growers have established a successful cover crop, 44% have released beneficial insects, and 66% have seen an increase in wildlife in their orchards. 76% of the growers say they are pleased with the quality of the nuts and their economic return, and they overwhelmingly agree that they would recommend the BIOS program to other farmers or PCAs.

BIOS continues to receive recognition for its unique contributions. In the last year, BIOS was honored with two awards. The first, from the San Joaquin Valley Unified Air Pollution Control District, was an "Award of Distinction" in recognition of BIOS as a pollution prevention project, for its significant contributions to air quality improvements in the San Joaquin Valley. The second, awarded by the Friends of the San Francisco Bay Estuary, recognized BIOS as an outstanding Comprehensive Conservation Management Plan project. BIOS was also heralded as one of the world's best pesticide use reduction programs by a recently released study by the World Resources Institute.

E. Proposed Scope of Work

Support from CALFED will complement existing funding from Category III, as well as funding from the State Water Resources Control Board, the U.S. EPA, and several private foundations including the Pew Charitable Trusts, Greenville Foundation, and the Charles Stewart Mott Foundation. We propose five main areas of activity:

Task One: Implement an intensive media campaign to enlist mainstream farmers in CAFF's pesticide reduction programs.

CAFF will hire public relations and media consultants and designers to craft our public outreach campaign, produce educational materials, and purchase new computer equipment to manage our data base. The following will be coordinated by the CAFF Communications Department (please see attached timeline for relevant dates for

[2] Ross, *et al.*, "Distribution and Mass Loading of Insecticides in the San Joaquin River, California," EPA-Department of Pesticide Regulation, 1997, EH96-02.

this and all subsequent Tasks):

1. Hire a full-time media outreach coordinator to oversee and implement all activities.
2. Develop a targeted outreach strategy using media and public relations consultants to refine the message and identify influential media sources.
3. Improve outreach materials including organizational brochure, program fact sheets, and support materials for almond farmers and other conventional growers.
4. Unify and manage CAFF's databases for effective, well-coordinated outreach.
5. Implement media outreach efforts that guide conventional growers to LFN meetings and BIOS events.
6. Evaluate efforts through quantity and quality of feedback, and make necessary changes in the strategy.

Task One Deliverables:

- New multi-media educational materials
- Widespread agricultural media exposure, including paid print advertisements, articles, and radio time
- Records of response from outreach, including phone logs and event attendance forms

Task Two: **Continue to coordinate BIOS in San Joaquin, Madera and Colusa Counties through the 1999 growing season.**

CAFF will continue all activities currently carried out by the BIOS Program through a fourth season. We have determined that a fourth year of intense CAFF involvement will solidify the progress we have made in these counties, after which time we will transfer the program leadership to a local coordinator (as described in Task Three).

BIOS activities over the next year will include: Management Team meetings, field days, grower support from management team, current publications, grower program evaluation and extensive survey of grower practices. BIOS will provide the following technical support:

1. Coordinate Management Team meetings to provide direction and ideas for field days, recruitment, technical issues, and ongoing program development.
2. Hold field days and workshops: CAFF will organize and coordinate frequent on-farm field days and workshops where participants learn about pest and disease identification, cover crop management, biological control, orchard floor management and other timely topics.
3. Produce *BIOS Field Notes*, a publication specific to almonds, containing notes from the field, monitoring information and timely updates on pest pressures in each county area. This widely read publication will be sent to all participating growers.
4. Produce quarterly newsletter, the *BIOS Update*, for all program participants and interested parties. This publication includes information and appropriate news about all the BIOS projects.

Task Two Deliverables:

- *BIOS Field Notes* (4–6 issues)
- *BIOS Update* (quarterly)
- Management team meeting agendas and notes (6 times)
- Field Day/Workshop flyers, agendas and sign-in lists

Task Three: **Oversee the transition of these three BIOS projects to local institutions.**

Over the last year CAFF initiated the transfer of BIOS coordination to local leadership in Merced County. We guided the local Resource Conservation District through the process of hiring a local coordinator who will carry on BIOS activities indefinitely. Using our experience in Merced County as a model, we are now beginning a similar transition process in Stanislaus County. By the 1999-2000 growing season the BIOS projects in Colusa,

Madera, and San Joaquin Counties will be ready for transition to local leadership. We will identify interest in and then assist organizations such as Resource Conservation Districts to hire local coordinators to promote BIOS-style activities in these counties.

Coordinating a BIOS project requires an array of skills such as event planning and production, project planning, group facilitation, and a background in agriculture including knowledge of agronomy and pest management. Throughout the transition period CAFF's Transition Coordinator will mentor the locally hired coordinators in their practice of these skills.

1. Formulate a plan for the transition of BIOS activities to local leadership in Colusa, Madera, and San Joaquin Counties. This will include finding local stakeholders, involving community leaders and other related projects and forming a transition advisory team (TAT).
2. Coordinate with the TAT to ensure that the new leadership remains connected to the community of growers, educators, agency personnel and agricultural consultants that have been part of the project.
3. Train a local coordinator in event planning and production, project planning, group facilitation and orchard pest management.
4. Guide local program activities including field days, publication of a quarterly newsletter, development and maintenance of a database designed to provide outreach to growers, and outreach to local pest control advisors.
5. Develop a fund raising strategy to insure on-going local activity, which will include grant writing, fund raising events and charging for service.

Task Three Deliverables:

- Written Transition Plans (for San Joaquin, Colusa, and Madera Counties)
- Fund raising plan
- Agenda and minutes from TAT meetings (4-6 meetings)
- Field Day flyers and attendance roster

Task Four: Use the Lighthouse Farm Network to offer consistent technical support to conventional farmers and BIOS growers.

We will draw in growers who respond to the media campaign and reach out to local groups not yet aware of BIOS, LFN, and CAFF chapter activities, including local Farm Bureau chapters, church groups, and Grange groups. LFN coordinators will give regular presentations at meetings sponsored by these and other local groups. In addition, LFN coordinators will provide ongoing support to BIOS-style activities after the transition to local leadership occurs. Through this support and involvement, CAFF will maintain a role in BIOS activities even after it is no longer the program's leader.

1. Initiate a monthly LFN meeting in San Joaquin County.
2. Hire and train LFN coordinators in San Joaquin and Madera Counties.
3. Develop relationships with local community leaders, including irrigation district board members, to extend the awareness and influence of local CAFF activities.
4. Actively support the transition of BIOS to local leadership in all five counties.
5. Hold regularly scheduled LFN breakfast or lunch meetings and field days.
6. Build CAFF database of interested, and potentially interested farmers.
7. Produce monthly LFN newsletter, *The Foghorn*.

Task Four Deliverables:

- Monthly newsletter reporting on LFN events
- Field day flyers and meeting announcements
- Calendar of direct outreach activities to local organizations and agencies

Task Five: Reporting to CALFED.

Quarterly reports on the progress of implementing this four tiered information and model demonstration project will be submitted to CALFED. The reports will include requests for payment, narratives and financial reports. We will also submit an annual report.

Task Five Deliverables:

- Quarterly financial and narrative reports to CALFED
- Annual report evaluating overall impact of program to CALFED

F. Monitoring and Evaluation

This project will use a variety of quantitative and qualitative measures to evaluate the effectiveness of the program. These include:

1. Evaluation of media impact on the public: We will maintain records of respondents to our media campaign, including telephone logs, event attendance or other opportunities for feedback. Outcomes from these phone contacts will also be evaluated.

2. Annual evaluation of pesticide use changes: The California Institute for Rural Studies (CIRS) will use the State's own pesticide use reporting data base to monitor any reductions in pesticide use. CIRS will look at five counties (Merced, Stanislaus, Madera, San Joaquin, and Colusa), tracking BIOS growers on their pre-BIOS use of target chemicals and use since enrolling in BIOS. They will also compare results with county averages of pesticide use. CIRS will look at trends for use of targeted pesticides before and after the project period to determine impact of media penetration on pesticide use. They will also compare BIOS growers against a random selection of non-BIOS almond farmers in each county (matching enrolled growers in similarities of acreage, tree varieties and soil types).

3. Annual grower survey and evaluations: CAFF will collect and analyze information from all enrolled BIOS farmers at the completion of each growing season. This will include all pesticide use application and reductions, as well as adoption of biologically-based, environmentally sound practices. We will also ask enrolled farmers about their satisfaction with the project. This information will be compiled into an annual report.

G. Implementability

We have seen from our current successes that we are able to influence the farming practices of almond growers and reduce water quality stressors in the San Joaquin and Sacramento River Watersheds. Regulatory threats of water and ecosystem stressing chemicals, including diazinon, along with technical support for viable, non-chemical alternatives has allowed us to influence 10% of the almond acreage in the five counties in this project. Other key components to our success have been the relationships we have developed and nurtured with local collaborators and CAFF's ability to work effectively with local farming communities. We recognize that buy-in on the local level is critical to insure long-term and widespread adoption of these biologically-based farming techniques.

Having identified the elements of a successful outreach and demonstration project, we are asking CALFED to fund the next phase: active conversion of a target population in the Bay Delta watersheds to a non-pesticide future. Only if BIOS goes beyond the demonstration phase will there be a widespread impact on farming practices, and therefore, on water quality.

I-006285

IV. Costs and Schedule to Implement Proposed Project

a. Budget Costs

The budget presented with this proposal represents CAFF's experience in creating and administering the BIOS program for the last four years and research that has taken place in recent weeks. The Budget has been designed to take advantage of CAFF's existing staff and the expertise that has been built up in recent years. There are, therefore, only five new positions identified into this scheme, and three are 25%-time LFN coordinator positions.

The salient assumptions of this budget include:

1) Salary levels are presented at market levels which, at this time, are somewhat higher than existing CAFF salary ranges. If CAFF is to retain the expertise necessary to complete a project of this magnitude, salaries will have to keep pace with the opportunities available elsewhere to our highly professional staff.

2) An annual inflator of 5% has been applied to both personnel and program expenses except in those areas where task functions are slated for elimination or completion prior to the end of the project period. Changes in staffing or program from year to year under each task are noted. Otherwise, budget figures assume no changes in staff or program from year to year.

3) The whole project at full cost levels is presented in this budget. If CALFED elects to partially fund the project as outlined, additional funding will be sought to carry out the project as outlined or the scope of the project will be reduced. Past funding for BIOS has been provided by a number of private foundations and other governmental agencies. Future funding levels, particularly beyond 1998, remain to be established.

4) Task I assumes that all media planning work would be completed in 1998, and media consultations in 1999 and 2000 would be required for fine tuning only. Also, media purchases would become more efficient as we learn to target and select our media vehicles. Since virtually all of CAFF's current computer equipment is five years old or older, substantial upgrades and additions will be necessary to carry out the outlined work.

5) Task II funding for 1998 is substantially in place. However, the budget calls for a one-year extension of the full BIOS program in San Joaquin, Madera and Colusa counties through 1999. BIOS activity in those counties in 2000 would be directed through the LFN program.

6) Task III transition work assumes current levels of activity would be extended through 2000.

7) Task IV assumes that LFN will expand San Joaquin, Madera, and Colusa county activities to actively promote BIOS techniques and reach non-almond farmers. Three new 25% time local coordinators would be hired as well as a 50% time program coordinator. The level of commitment would remain constant through 1998, 1999 and 2000.

8) Task V reporting activities are based on a reassessment of the cost to the organization of complying with governmental reporting rules, staffing of audits requested by CALFED and others, and general record keeping necessary to provide accurate results to grantors. The California Institute of Rural Studies has been asked to submit an estimate of the costs involved in providing pesticide use data. Although CIRS is uniquely qualified in this area, final determination of the scope of work and contractual relationship and any additional bidding would depend on funding.

9) Overhead items include occupancy (fully allocated costs including heat and light for headquarters office and new regional offices), wear and tear on equipment and the cost of repairing or replacing general office equipment, general management oversight, planning and training of employees and orientation of consultants.

I-006286

IV, a. Budget

budget page 1.

TOTAL PROJECT BY YEAR		
1998		
Task I	262,325	
Task II	0	
Task III	33,500	
Task IV	115,300	
Task V	61,300	
Total 1998		472,425
1999		
Task I	197,616	
Task II	389,165	
Task III	35,200	
Task IV	118,400	
Task V	62,800	
Total 1999		803,181
2000		
Task I	181,750	
Task II	0	
Task III	37,100	
Task IV	122,200	
Task V	64,400	
Total 2000		405,450
TOTAL PROJECT		1,681,056

I-006287

budget page 2.

Task I - 1998 Media Campaign	Direct Labor Hours	Direct Salary & Ben. (18%)	Service Contracts	Material & Acq Contracts	Misc. & Other Direct	OH Labor (Gen, Admin & Fee)	Total by Budget Area
Personnel							
- Executive Director	250 hours					8,000	
- Program Director (Communitions)	20 hrs/wk					23,600	
- Program Director (BIOS/LFN)	5 hrs/wk					6,125	
- Media Outreach	40 hrs/wk	40,000					
- Admin Assistant	10 hrs/wk					5,900	
- Office Manager	100 hours					1,700	
- Finance Director	150 hours					2,500	
Total Personnel							87,825
Program Expense							
- Media/PR consultants			36,000				
- Media/Outreach Materials							
(Ads, Radio Pdtn)				20,000		-	
- Database Upgrade & Management							
-- Management Consultant						10,000	
-- Equipment Upgrades & Acq.						35,000	
- Occupancy						8,000	
- Media Purchases							
-- Print Advertising							
(Ag Alert, Nut Grower, etc.)					29,500		
-- Radio Time							
(Sponsorships & Direct Ads)					21,500		
- Travel, Supplies, Phone & Fax					7,000		
- Mailings (BIOS updates, etc.)					7,500		
Total Program Expense							174,500
Total Task I - 1998		40,000	36,000	20,000	65,500	100,825	262,325
Task I - 1999							
Personnel		42,000				50,216	92,216
Program Expense							
- Media/Outreach Materials				16,000			
- Consultants (Media, Database, etc.)			15,000				
- Occupancy						8,400	
- Media Purchases					50,000		
- Travel, Supplies, Phone & Fax					8,000		
- Mailings					8,000		
Total Program Expense							105,400
Total Task I - 1999		42,000	15,000	16,000	66,000	58,616	197,616

I-006288

Task 1 - 2000	Direct Labor Hours	Direct Salary & Ben. (18%)	Service Contracts	Material & Acq Contracts	Misc. & Other Direct	OH Labor (Gen, Admin & Fee)	Total by Budget Area
Personnel		44,000				52,750	96,750
Program Expense							
- Media/Outreach Materials				10,000			
- Consultants (Media, D/B, etc.)			10,000				
- Occupancy						9,000	
- Media Purchases					40,000		
- Travel, Supplies, Phone & Fax					6,000		
- Mailings					10,000		
Total Program Expense							85,000
Total Task 1 - 2000		44,000	10,000	10,000	56,000	61,750	181,750
TOTAL Task 1 - 1998 - 2000							641,691

Task II - 1998 San Joaquin, Madera & Colusa BIOS	Direct Labor Hours	Direct Salary & Ben. (18%)	Service Contracts	Material & Acq Contracts	Misc. & Other Direct	OH Labor (Gen, Admin & Fee)	Total by Budget Area
- 1998 funding in place							
Task II - 1999							
Personnel							
- Executive Director	5 hrs/wk					9,000	
- Program Director	10 hrs/wk					13,275	
- Research & Doc. Coordinator	40 hrs/wk	25,960					
- Asst. Monitor Coordinator	40 hrs/wk	33,000					
- Project Coordinator	40 hrs/wk	45,000					
- Project Coordinator	40 hrs/wk	45,000					
- Program Coordinator	40 hrs/wk	45,000					
- Asst. Program Coordinator	40 hrs/wk	25,960					
- Admin Assistant	10 hrs/wk					6,500	
- Office Manager	10 hrs/wk					9,735	
- Finance Director	10 hrs/wk					9,735	
Total Personnel		219,920				48,245	268,165
Subcontracts							
(Farm plans, Farm Advisors							
General Consulting)							
- Consultants			40,000				40,000
Program Expense							
- Conferences & Meetings					15,000		
- Postage					5,000		
- Printing/Copies					7,500		
- Supplies (Office & Field)					4,500		
- Phone & Fax					6,000		
- Travel					16,500		
- Equipment (replace/maintain)						5,000	
- Occupancy						16,000	
Total Program Expense					54,500	21,000	75,500
Computer Equipment							
(replace/maintain)						5,500	5,500
Total Task II - 1999		219,920	40,000	0	54,500	74,745	389,165
Task II - 2000							
See Task IV - LFN							
- Task completed by 12-1999							
TOTAL Task II 1998 -2000							**389,165**

Task III 1998 - BIOS Transition (San Joaquin, Madera & Colusa progs)	Direct Labor Hours	Direct Salary & Ben. (18%)	Service Contracts	Material & Acq Contracts	Misc. & Other Direct	OH Labor (Gen, Admin & Fee)	Total by Budget Area
Personnel							
- Executive Director	100 hrs					3,100	
- Program Director	200 hrs					4,500	
- Program Coordinator	400 hrs	7,900					
Total Personnel		7,900				7,600	15,500
Program Expense							
- Travel, phone, fax, copies, misc.					18,000		18,000
Total Task III - 1998		7,900			18,000	7,600	33,500
Task III - 1999							
Personnel		8,300				8,000	16,300
Program Expense					18,900		18,900
Total Task III - 1999		8,300			18,900	8,000	35,200
Task III - 2000							
Personnel		8,700				8,400	17,100
Program Expense					20,000		20,000
Total Task III - 2000		8,700			20,000	8,400	37,100
TOTAL Task III - 1998 - 2000							**105,800**

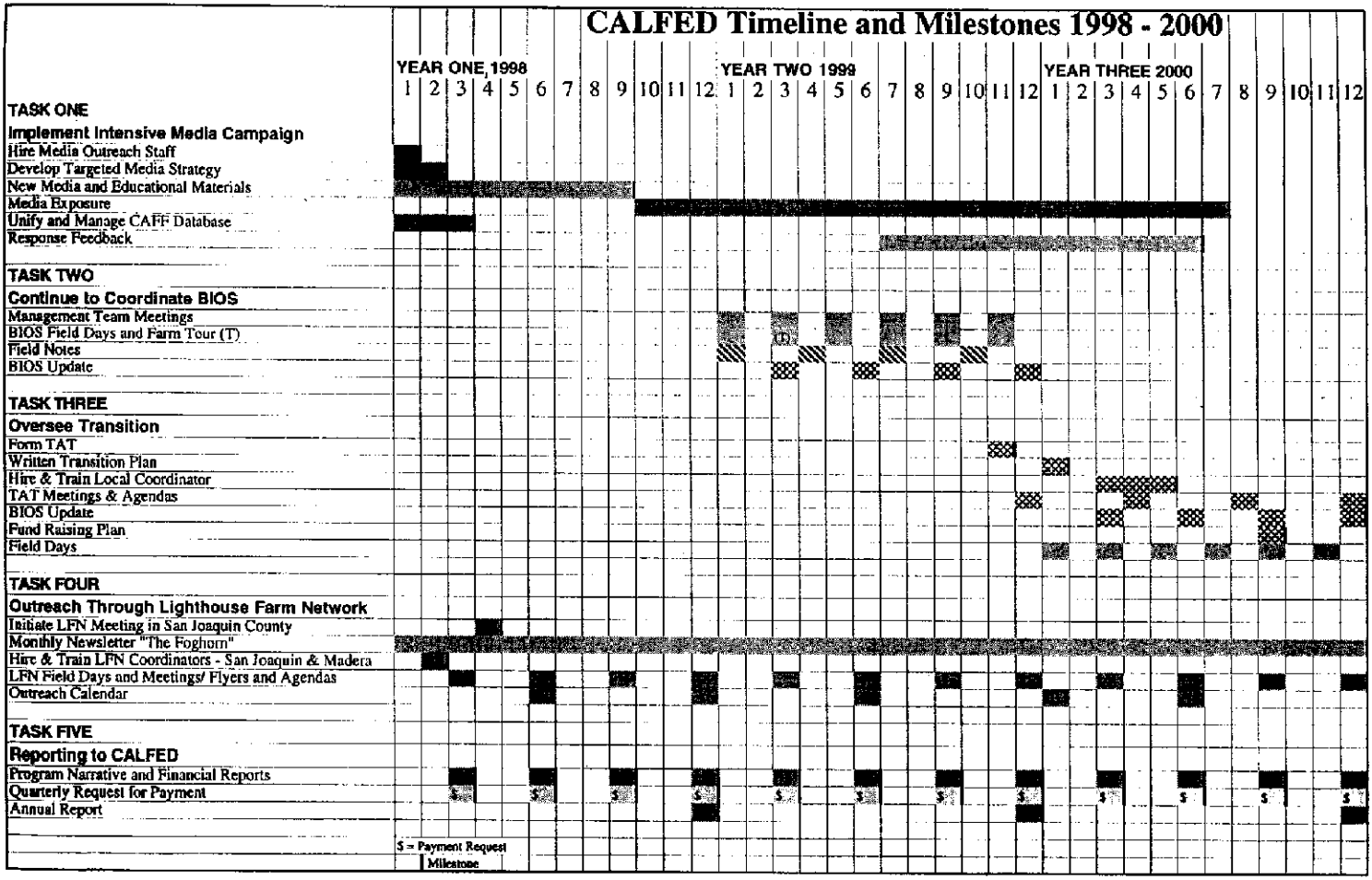
Task IV - 1998 - LFN Support	Direct Labor Hours	Direct Salary & Ben. (18%)	Service Contracts	Material & Acq Contracts	Misc. & Other Direct	OH Labor (Gen, Admin & Fee)	Total by Budget Area
Personnel							
- Executive Director	5 hrs/wk					8,150	
- Program Director BIOS/LFN	10 hrs/wk					12,250	
- Program Coordinator	10 hrs/wk	10,000					
- Asst. Program Coordinator	20 hrs/wk	14,750					
- Local LFN Coordinator (3 new)	10 hrs/wk ea	21,250					
- Office Manager	100 hrs					3,400	
Total Personnel		46,000				23,800	69,800
Program Expense							
- Postage					5,000		
- Printing/Copies					7,000		
- Supplies (Office & Field)					3,000		
- Phone & Fax					6,000	-	
- Travel					8,000		
- Occupancy (field offices incl.)						12,000	
Total Program Expense					29,000	12,000	41,000
Computer Equipment						4,500	4,500
Total Task IV - 1998		46,000			29,000	40,300	115,300
Task IV - 1999							
Personnel		48,300				25,000	73,300
Program Expense					30,500	12,600	43,100
Computer Equipment						2,000	2,000
Total Task IV - 1999		48,300			30,500	39,600	118,400
Task IV - 2000							
Personnel		50,700				26,250	76,950
Program Expense					32,000	13,250	45,250
Total Task IV - 2000		50,700			32,000	39,500	122,200
TOTAL Task IV - 1998 - 2000							**355,900**

budget page 7.

Task V - 1998 Reporting	Direct Labor Hours	Direct Salary & Ben. (18%)	Direct Service Contracts	Material & Acq Contracts	Misc. & Other Direct	OH Labor (Gen, Admin & Fee)	Total by Budget Area
Personnel							
- Executive Director	50 hrs					1,500	
- Program Director	100 hrs					2,300	
- BIOS Program Coordinator	100 hrs	2,000					
- LFN Program Coordinator	100 hrs	2,000					
- Admin Assistant	200 hrs	2,250					
- Office Manager	50 hrs					850	
- Finance Director	100 hrs					1,700	
Total Personnel		6,250				6,350	12,600
Program Expense							
- Meetings					2,000		
- Postage					500		
- Printing/Copies					500		
- Supplies					750		
- Phone & Fax					850		
- Travel					1,800		
- Equipment (replace/maintain)						2,500	
- Occupancy						4,800	
Total Program Expense					6,400	7,300	13,700
Computer Equipment						3,000	3,000
Monitoring Pesticide Use - CIRS			32,000				32,000
Total Task V - 1998		6,250	32,000		6,400	16,650	61,300
Task V - 1999							
Personnel		6,600				6,700	13,300
Program Expense					6,700	7,700	14,400
Computer Equipment						1,500	1,500
Monitoring Pesticide Use - CIRS			33,600				33,600
Total Task V - 1999		6,600	33,600		6,700	15,900	62,800
Task V - 2000							
Personnel		7000				7000	14000
Program Expense					7000	8100	15100
Monitoring Pesticide Use - CIRS			35300				35300
Total Task V - 2000		7000	35300		7000	15100	64400
TOTAL Task V - 1998 - 2000							**188,500**

I-006293

IV, b. Timeline and Milestones



C. Third Party Impacts

The BIOS and LFN models have a number of positive impacts on air and water quality that flow from adoption of biologically balanced farm systems. There are no negative impacts on rural communities or other third parties from this activity.

I-006295

V. Applicant Qualifications

CAFF is a 501 (c) (3), membership based organization with farmers, environmentalists, small business owners, social justice advocates, urban people, gardeners and community activists playing lead roles on our Board, advisory committees, and working groups. Our 1997 budget of $1.2 million supports the work of 40 full and part-time staff located in the Davis central office, as well as field offices in the Central Coast and the San Joaquin Valley.

CAFF has worked with family-scale growers for nearly twenty years. We have a reputation in California agriculture for creating strong cooperation between all the "stakeholders" in the issues we take on. The BIOS program is a shining example of our ability to bring together growers, researchers, government agencies and industry leaders to successfully implement creative alternatives to conventional farming practices.

CAFF's unique contributions to the farm community have won respect from a wide range of audiences. Our work to improve water quality, and to ensure that "third party" impacts of water policy are recognized, won us a seat on the CALFED Advisory Committee. Judith Redmond, a farmer and former Executive Director of CAFF, serves on the BDAC committee and is Chair of the Water Use Efficiency subcommittee. CAFF staff, Board and volunteers also serve as leaders in state and local forums including both public and industry organizations, from the UC Sustainable Agriculture Research and Education Program Advisory Committee to the Almond Board Research Subcommittee.

California Institute for Rural Studies (CIRS), providing this project with evaluation services, is a non-profit research and education organization also based in Davis. CIRS has earned a reputation for high quality and objective research from many arenas, and has been hired by groups ranging from the U.S. Bureau of Reclamation to the Teamsters Union to do original research and data base development in agricultural issues. They have special expertise in pesticide use report analysis.

This project also works in collaboration with the top almond researchers and extension agents from the University of California. Participation from a broad range of government regulators and agencies such as Resource Conservation Districts, local Junior College professors, and others brings an unusually high degree of both scientific and technical skill to this project.

Potential Conflict of Interest Declaration

Judith Redmond currently serves on the BDAC committee and is Chair of the Water Use Efficiency subcommittee. Until October, 1996, Ms. Redmond was Executive Director of the Community Alliance with Family Farmers. She continues as a consultant to the organization focusing on natural resource policy issues, and she has had no involvement in the development or writing of this proposal.

Although no conflict of interest has been found in the past relative to her relationships to CAFF and BDAC, Ms. Redmond has explored the issue with BDAC staff. Per the July 9, 1997, memorandum to Lester Snow and Mike Madigan from Mary J. Scoonover, Deputy Attorney General, we believe that Ms. Redmond has at most a "remote interest" in this proposed contract between CALFED and CAFF. Nevertheless, we are taking this opportunity to disclose Ms. Redmond's relationship with CAFF, and we expect it will not present any difficulty should a contractual relationship develop in the future between CALFED and CAFF.

I-006296

Brief Biosketches of Key Staff

Ernest Phinney, Executive Director

Ernest Phinney became Community Alliance with Family Farmers Executive Director on October 1, 1996. Mr. Phinney brings almost 25 years of non-profit management experience to his responsibilities including five years as a management/fundraising consultant, four years as Executive Director of the Sacramento Ballet, and the balance in various fundraising, marketing and general administrative positions for universities, cultural and social service organizations. Since, 1990, Mr. Phinney has been co-proprietor of Fiddletown Farms, a beef cattle operation specializing in direct marketing of hormone and antibiotic-free Limousin beef cattle.

Jill Klein, Associate Director/ Agricultural Programs

Jill Klein has been working at the Community Alliance with Family Farmers since August, 1992. For four years, she was the Lighthouse Farm Network Program Coordinator. The Lighthouse Farm Network, a flagship program of the organization, provides a forum for farmers and other agricultural professionals to share information on farming systems which are profitable yet rely less on chemical inputs. With nearly 1,500 participants and 15 monthly meetings, the program provides technical support and builds a sense of community among farmers interested in alternative farming practices. Additionally, Ms. Klein was a founding management team member and coordinator of BIOS. In her current position of Associate Director/Agricultural Programs, Ms. Klein provides program direction and oversight for the Biologically Integrated Orchard Systems (BIOS), the Lighthouse Farm Network, and Community Supported Agriculture (CSA) West programs.

Marcia Gibbs, BIOS Program Coordinator/Administration and Documentation

Marcia Gibbs has been working for the Biologically Integrated Orchard Systems Program of Community Alliance with Family Farmers since October, 1996. She is responsible for the supervision of BIOS staff, overall program coordination and writing program reports and evaluations. Ms. Gibbs also promotes the BIOS program to the agricultural community, farmers and researchers. Marcia has been a small family farmer on a rice ranch in the Sacramento Valley. She has a secondary teaching credential in vocational agriculture and an MBA.

Reggie Knox, Lighthouse Farm Network Program Coordinator

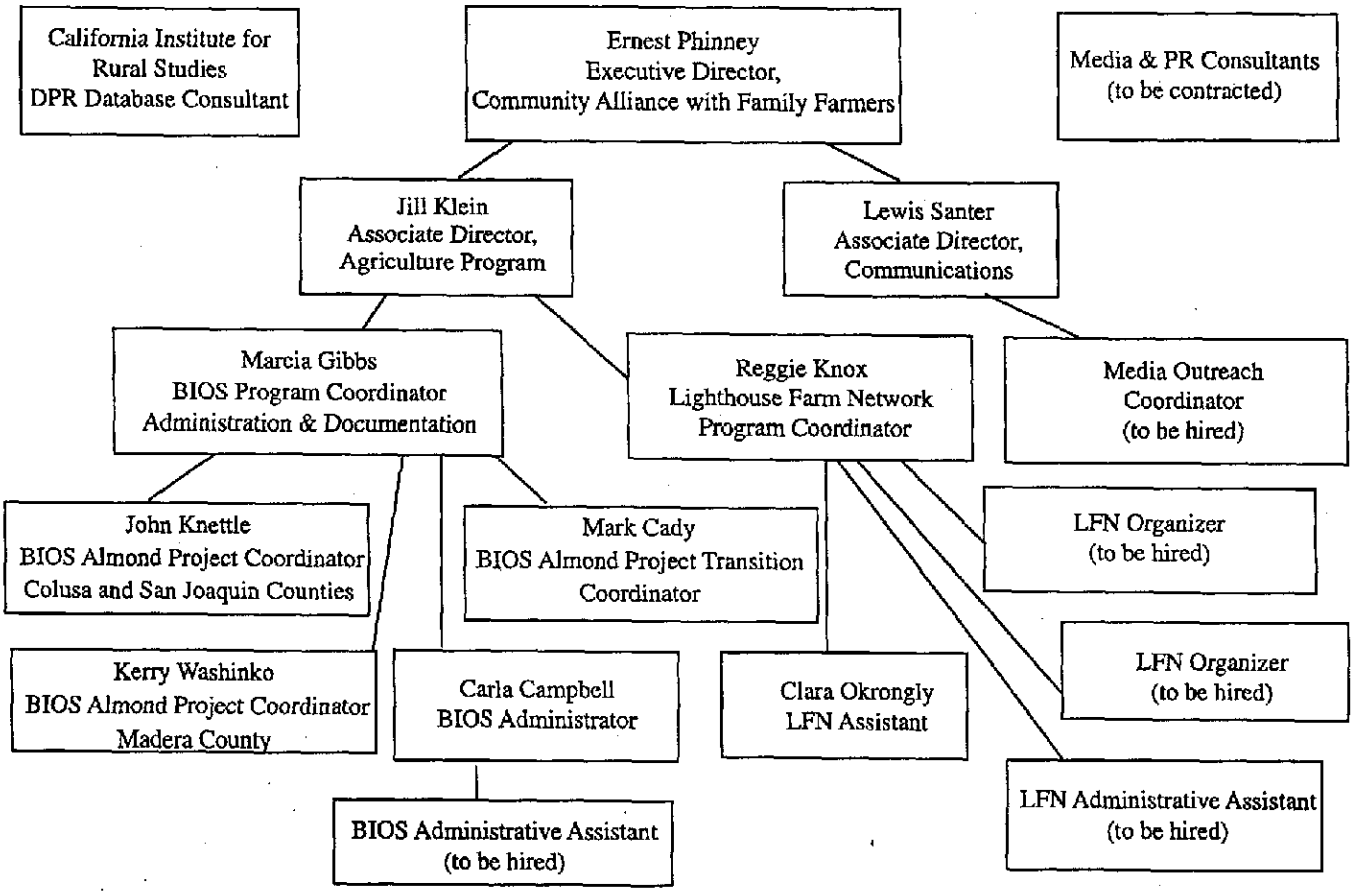
Reggie Knox came to CAFF in 1994 to coordinate legislative efforts and outreach for the BIOS program. He now coordinates the statewide Lighthouse Farm Network, organizing meetings and field days throughout the state and supervising local meeting organizers in fifteen locations. Mr. Knox has ten years of experience in sustainable agriculture. He managed a 12 acre, diverse organic farm. He worked with the California Certified Organic Farmers (CCOF) building a farm inspection program, developing national organic standards and inspecting California organic farms for over seven years. He was a Rotary Foundation Graduate Research Scholar in sustainable agricultural development and restoration ecology in Sri Lanka and India and has consulted in sustainable agriculture and community development in Africa and the California Central Coast. Mr. Knox is a graduate of UC Santa Cruz Earth Sciences and Community Studies Programs.

Ingrid Wallen, Associate Director/Communications

Ingrid Wallen has been working with Community Alliance with Family Farmers since January of 1995. Originally, Ms. Wallen lent her experience to our award winning *Farmer to Farmer* Magazine as the Marketing and Circulation Manager. Currently, as a Management Team member and Associate Director of CAFF's Communications, she is responsible for managing the Communications Department, including all CAFF publications, other outreach materials, and public relations. In addition to her prior work with other membership organizations., Ms. Wallen's previous experience includes working with a residential public service magazine as the Business Manager, Co-Publisher and Controller.

I-006297

CALFED Project
Program Organizational Chart



7/97

Attachments

Non-Discrimination Compliance Statement

BIOS Update

1996 Year End Almond Survey Analysis

BIOS Project Map

LFN Meetings Map

CIRS Letter

Farmer to Farmer

I-006299

Item 8

NONDISCRIMINATION COMPLIANCE STATEMENT

COMPANY NAME
COMMUNITY ALLIANCE WITH FAMILY FARMERS

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME
ERNEST PHINNEY

DATE EXECUTED
JULY 26, 1997

EXECUTED IN THE COUNTY OF
YOLO

PROSPECTIVE CONTRACTOR'S SIGNATURE

PROSPECTIVE CONTRACTOR'S TITLE
EXECUTIVE DIRECTOR

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME
COMMUNITY ALLIANCE WITH FAMILY FARMERS FOUNDATION

I-006300

I-006300

THE LIGHTHOUSE FARM NETWORK

The mission of CAFF's Lighthouse Farm Network is to build a community of farmers and other agricultural professionals who readily share information about farming systems which increase long-term profitability yet rely less on chemical inputs. Through a statewide network of monthly meetings and field days, the Lighthouse Farm Network provides technical information and support to all those interested in biologically-based farming practices.

We have established monthly meetings in fifteen regions around the state. Three essential components draw farmers to the Network:

Technical Support

- Provide organized forums for farmer to farmer information sharing.
- Facilitate increased participation of research and extension with the Lighthouse Farm Network community.
- Provide support enabling farmers to develop long-term stewardship plans for their farm which include the interaction between people, land and economics.

Community Building

- Continue to build an inclusive Lighthouse Farm community and social network.
- Increase access to and availability of products and services which benefit the Lighthouse Farm Network community.
- Work with CAFF programs to create linkages between farmers and ag professionals, organization and institutions.
- Clarify the importance of the role of policy in furthering the goals of the Lighthouse Farm Network.

Public Outreach

- Showcase successful and profitable farms that are part of the Lighthouse Farm Network, to a broad community of interests.
- Expand the Network to all important agricultural regions in California.

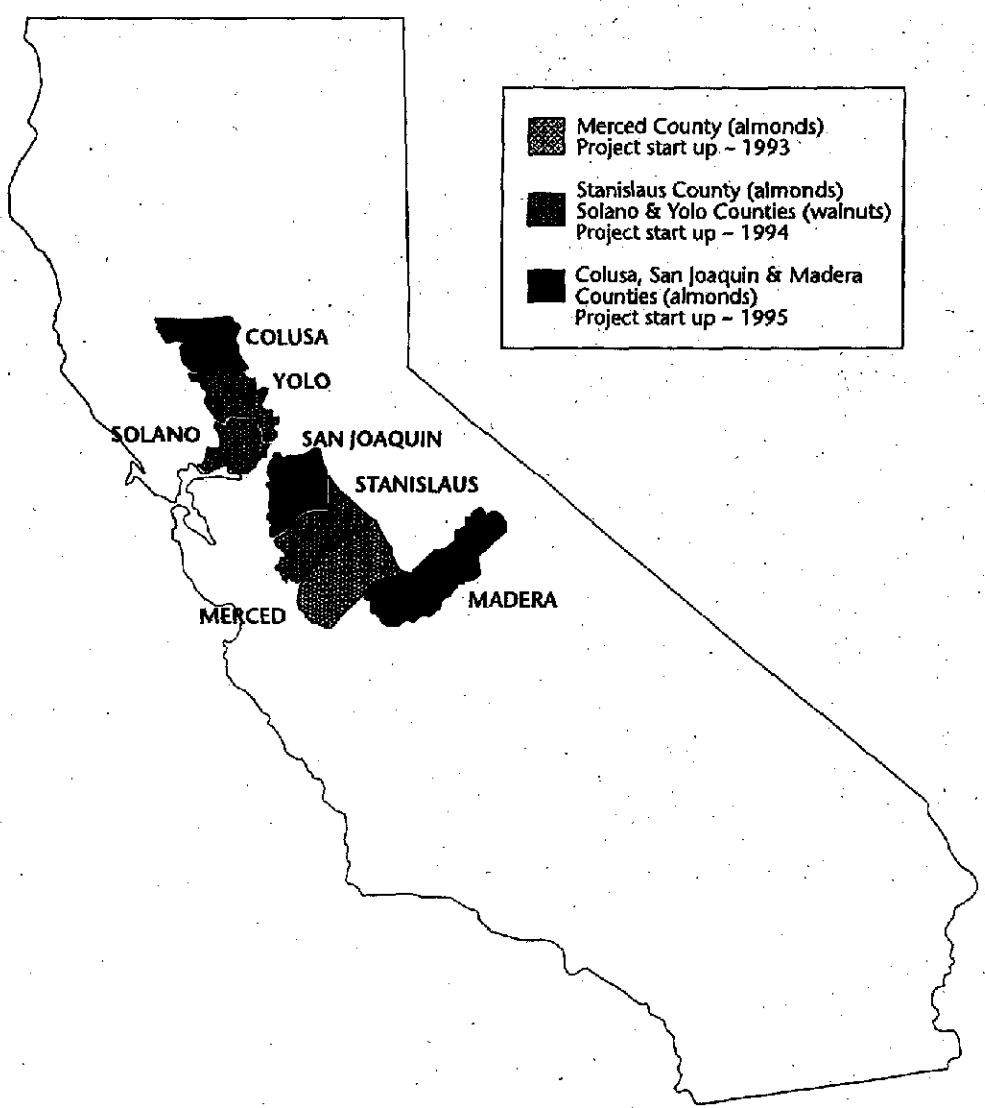
For more information on the Lighthouse Farm Network, contact Reggie Knox at 735 Chestnut Street, Santa Cruz 95060; phone: 408/457-1007; fax: 408/457-1003.

Community Alliance *with* Family Farmers PO Box 363 Davis, California 95617
Phone: 916/756-8518 Fax: 916/756-7857 e-mail: lfn@caff.org www.caff.org

The Community Alliance with Family Farmers (CAFF) is a membership-based educational and advocacy nonprofit organization, with chapters throughout California. Our mission is to build a movement of rural and urban people who foster family-scale agriculture that cares for the land, sustains local economies and promotes social justice.

I-006301

BIOLOGICALLY INTEGRATED ORCHARD SYSTEMS IN CALIFORNIA



I —0 0 6 3 0 2

I-006302

1996 Year End Almond Survey Analysis

Biologically Integrated Orchard Systems

A Project of the
Community Alliance with Family Farmers

CAFF
P.O. Box 363, Davis, CA 95617
916.756.8518

I—006303

I-006303

Table of Contents

Community Alliance with Family Farmers

BIOLOGICALLY INTEGRATED ORCHARD SYSTEMS (BIOS) ALMOND PROGRAM

EXECUTIVE SUMMARY

- In 1996, the BIOS Program had 72 enrolled walnut and almond growers in seven counties throughout the state. Together they farm more than 10,000 acres using BIOS management techniques.
- 90% of BIOS almond growers eliminated the use of insecticide dormant sprays.
- Overall use of organophosphate insecticides has decreased 71% since the beginning of the BIOS Program.
- Since joining the BIOS Program, over 75% of all growers have established a successful cover crop, 44% have released beneficial insects, and about 50% have reduced the amount of nitrogen applied to their orchards. 66% have seen an increase in wildlife in their orchards.
- Overall, BIOS growers have reduced the amount of nitrogen fertilizer, herbicides, and insecticide sprays they apply. Most importantly, 76% say they are pleased with the quality of the nuts and their economic returns.
- Results from the survey of BIOS growers shows that 85% of all BIOS almond growers use BIOS' field days, *Field Notes*, management team advice, and *BIOS for Almonds* to help them make pest management and fertility decisions.
- By communicating with other farmers and sharing on-farm innovations, BIOS participants are learning to farm in an environmentally friendly way. One BIOS grower remarked, "I'm learning to let nature do some of the work."
- Growers in the BIOS Program overwhelmingly agree that they would recommend the BIOS Program to other farmers or pest control advisors.
- BIOS information is reaching a growing audience. Over 750 farmers, pest control advisors, researchers and other almond industry professionals asked CAFF to put them on the BIOS mailing list this past year.

BIOS
BIOLOGICALLY INTEGRATED ORCHARD SYSTEMS

This report contains the results of the 1996 grower surveys and evaluations completed by enrolled growers in the BIOS Program. It includes a summary of the main management practices used by growers in the program, their satisfaction with these cultural practices, as well as grower comments regarding the program and its usefulness on their farms. Each year the BIOS Program model is updated and refined based on feedback from program participants.

B. SURVEY PURPOSE

Enrolled growers in each of the five counties who participated in the 1996 growing season were asked to complete a survey questionnaire. This survey was designed to determine the progress, strengths, and weaknesses of the BIOS Program. Data was collected on acreage enrolled, management practices used, pest damage, the use of agricultural chemicals, crop yield, and information on project effectiveness.

When possible, comparisons were made with pre-BIOS grower practices, using information obtained from the BIOS enrollment forms. Along with the survey questionnaire, a program evaluation was mailed to each grower which solicited input about program elements and areas for improvement.

Of the 54 enrolled almond growers, 53 completed a survey, for a 98% response rate. The results of these two evaluation tools are included in the results sections which follow.

C. SURVEY METHODOLOGY

A twelve-page grower survey questionnaire was prepared by CAFF staff (a copy is available upon request). This survey had several main categories:

- use of cover crops
- pest control practices
- nitrogen applications
- management practices applied
- harvest/economic information

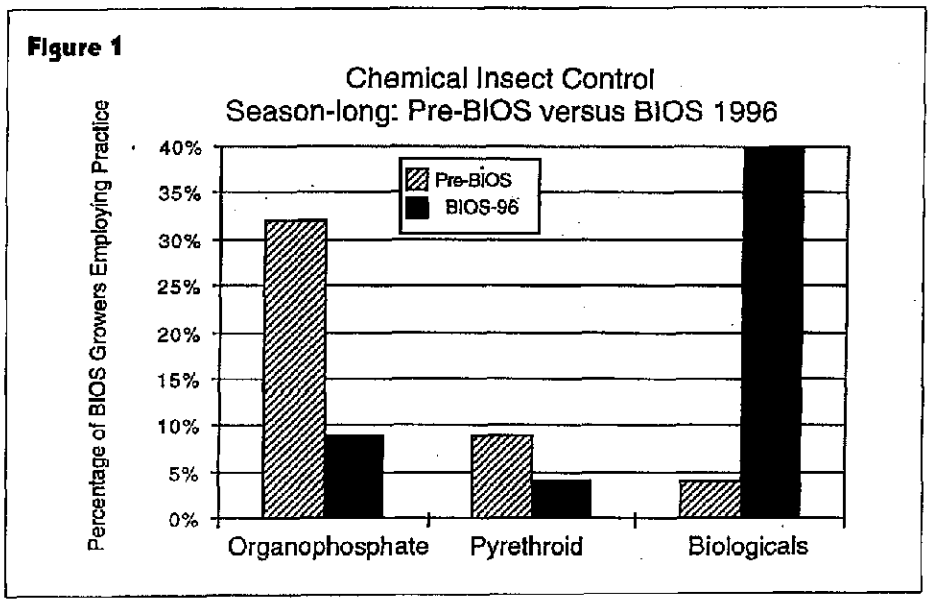
Each grower enrolled in the program for the 1996 growing season was interviewed via telephone, at which time the standardized survey questionnaire was completed.

It is important to note the difficulties inherent in this type of data collection. Many farmers do not keep day-to-day records on the timing of certain chemical applications. Many are applying less than the labeled rate, and some of the BIOS orchards are managed by farm managers other than the enrolled grower. It was sometimes difficult to obtain exact application rates of sprays or fertilizers. It is also difficult, in this report, to assess the total units of nitrogen applied because growers use many different types of fertilizers. Whenever possible, exact amounts of chemicals are recorded. In some cases we can identify a reduction, but not the exact amount of that reduction.

in the BIOS Program have eliminated the use of insecticide dormant sprays in their orchard. Ten percent used a pyrethroid, (Asana) or an organophosphate (Supracide).

Figure 1 compares pre-BIOS pesticide use to that under BIOS management. The figure shows a 71% reduction in the use of OPs since growers joined the BIOS Program. It also shows that BIOS growers have increased the use of biologicals by a magnitude of nine times from pre-BIOS levels.

Figure 1



2. Key Pests of Almonds

Numerous insects and mites inhabit almond orchards. Most cause little damage to the tree or nut crop. Some play a beneficial role in the orchard system by feeding on insect pests or other organic debris. Only a small fraction of species in an orchard cause economic damage to the crop. Of these, peach twig borer (PTB), navel orangeworm (NOW), San Jose scale, and webspinning mites (two-spotted and Pacific spider) have the greatest potential for economic impact on almonds in California. The information which follows on key almond pests was taken from the University of California publication, *Integrated Pest Management for Almonds* (1985).

orchards in Merced and Stanislaus Counties. One of the major finds of this study was the influence of winter sanitation in reducing the subsequent harvest infestation of navel orangeworm (NOW). "Those growers following recommended guidelines of fewer than two mummies per tree in February reduced NOW infestation by 48% over those that did not achieve this level," his report notes.

Biological Control

Several parasitic wasps are currently being studied for their effectiveness in controlling NOW. These include *Goniozus legneri* , *Trichogramma* and *Pentalitomastix plethorica*. Forty-four percent of BIOS almond growers released *Goniozus* and/or *Trichogramma* for NOW control.

Hull Split Sprays

It is at hull split that the threat of navel orangeworm (NOW) begins to mount. Hull split sprays are timed to correspond with NOW egg hatching as the hull begins to split on sound nuts in the tops of the trees. The hull does not need to be completely open to be considered split, just enough so that a visible opening is present. Using a hull split spray, such as the organophosphate Lorsban, at this time will provide a partially protective residue on the nuts. It is thought that spraying at hull split will suppress the early egg-laying period of the third generation and reduce the amount of damage on the unharvested nuts.

However, UC IPM research cautions that sprays for NOW can cause serious outbreaks of mites and destroy natural enemies of NOW and other insect pests. In Walt Bentley's comparison study, the level of NOW infestation at harvest crackout was statistically similar in the unsprayed BIOS orchards and in those that were conventionally managed. Only 11% of all BIOS almond growers applied a chemical hull split spray. The remaining 89% used no sprays or one to two applications of *Bts*.

c. San Jose Scale

San Jose scale does not directly feed on the nut crop but damages the tree, causing yield reductions and eventually killing the tree. It feeds on plant juices and contributes to an overall decline in vigor, growth and productivity.

Conventional orchard systems apply an insecticide spray during dormancy to control or prevent flare-ups of San Jose scale. If a dormant spray is not applied, a spring spray during emergence can be used. PTB and San Jose scale cannot be controlled with the same dormant spray due to differences in both the spray material and the timing.

Most BIOS growers are finding that they can effectively eliminate the use of dormant sprays. However, this reduction does raise some concerns about an increase in San Jose scale in almonds.

UC IPM Regional Entomologist Walt Bentley found in his 1996 BIOS and comparison orchard study that the level of scale was low in both the sprayed orchards and unsprayed BIOS orchards. "What was unexpected," says Walt, "was the abundance of *Prospaltella* and *Aphytis* (two key San Jose scale parasitoids) in the BIOS orchards." He feels that these two parasitoids are having a dramatic impact on

have changed the type and amount of herbicide they are applying, using materials that are less persistent in the environment.

There are two main types of herbicides which can be applied to the entire orchard floor, tree row or to the area at the base of the tree. Pre-emergence herbicides applied in the fall or early winter kill weed seedlings as they germinate. The BIOS Program discourages the use of pre-emergence herbicides, which can pose problems in the environment since they can persist in soil for a few months to a year or more and leach into ground water. Simazine, a widely used pre-emergence herbicide and a known ground water contaminant, has been targeted by the US EPA for reduction in California.

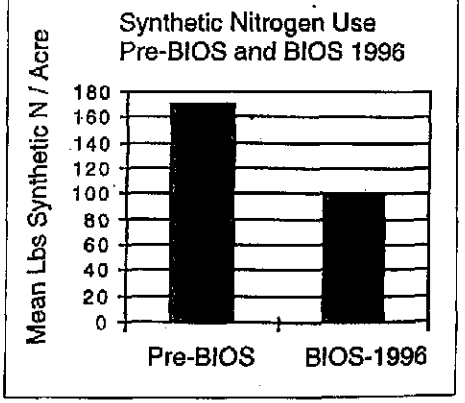
The second type of herbicide is a post-emergence herbicide which kills the weeds on the soil surface on contact. BIOS encourages program participants to utilize the less persistent post-emergence herbicides (like Roundup and Goal) which do not remain in the soil for a long time. About 80% of BIOS growers rely on these two herbicides almost exclusively.

BIOS growers are reducing not only the use of pre-emergence herbicides, but are also greatly reducing the amounts of herbicides they apply. Rather than uniformly spraying the entire orchard floor, many are using a strip treatment of herbicide in the tree rows to prepare the floor for harvest. The 1996 survey asked growers if they had reduced the width of this treated strip since joining the BIOS Program. One-third of all growers have reduced the width of the strip they treat with herbicide and many indicate they use less herbicide at each application and still get a clean orchard floor at harvest.

C. NITROGEN USE

Almond trees need adequate nitrogen for yield and growth to regenerate fruiting wood. However, current research indicates that excessive amounts of nitrogen may not benefit the orchard, but may actually cause increased disease pressure. Annual applications of large amounts of nitrogen are widely accepted, but not always justified. Nitrogen can leach from the soil and pollute ground water. Government regulation of nitrogen fertilizer to control excessive nitrates in the water is possible in the near future. The threat of nitrate contamination, coupled with the cost of nitrogen fertilizers, suggests that the best course of action is to increase the soil organic matter, not the amount or number of synthetic fertilizer applications.

Figure 2



BIOS growers are encouraged to make fertilization decisions based upon yearly leaf tissue analysis. Eighty percent of BIOS growers indicated they had a leaf tissue analysis done in 1996. This analysis, along with accounting for all other nitrogen sources such as cover crops or composting, can aid growers in dramatically reducing the amount of synthetic nitrogen they apply, as well as reducing the cost of their fertilizer program.

Still another method of irrigation scheduling is known as water budgeting, which makes use of crop evapotranspiration (ETo). Evapotransporation is the sum of moisture escaping from the tree leaves and evaporating from soil. This measurement is useful in determining when and how much to water. Actual ETo is a measurement of the rate of evapotranspiration using temperature and humidity from close-cut grass. This is multiplied by a coefficient for almonds to assist with almond orchard irrigation scheduling. The Average ETo is the historical average daily ETo which has been compiled for locations throughout California.

Growers in the BIOS Program were asked how they made decisions about when and how much to irrigate for 1996. Figure 3 shows their responses to this question.

When asked if they had changed the number of times they irrigate or the total amount of water used throughout the season, 38% indicated they had increased their water use. Some had made changes due to better observation skills or were using updated practices and equipment to make this determination. Many growers noted that while they had increased the number of times they irrigated due to a cover crop, they also felt they used less water overall, indicating that the cover crop had helped the soil's ability to retain moisture.

Figure 3
Irrigation Practices

Practice	Number of Growers Using Practice
Gypsum block readings	1
Tensiometer readings	15
Actual ET_o	7
Average ET_o	5
Check soil moisture with auger	20
Rotation schedule	9
Calendar	4
Visual	13

E. YIELD /ECONOMICS

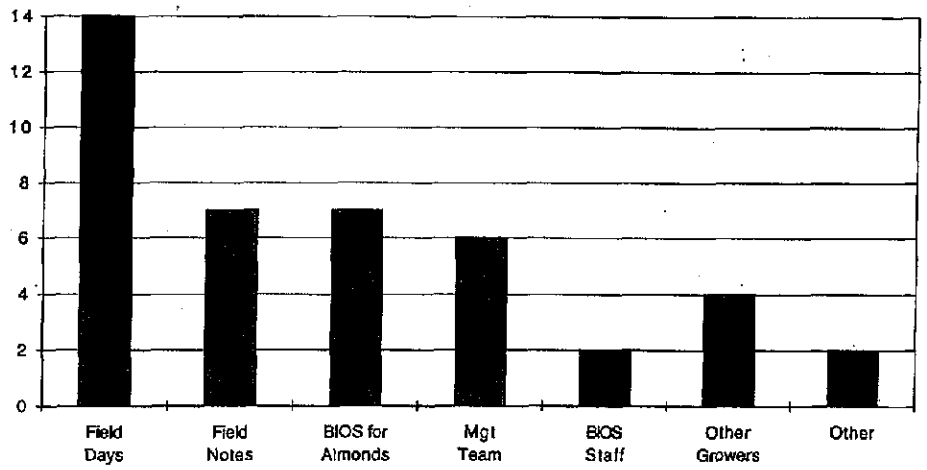
BIOS growers are finding that not only can they produce an economically viable crop, but they can do so by utilizing more biologically sound methods. In a recent study conducted by the Department of Agricultural & Resource Economics at UC Davis, "the economic viability of the BIOS practices was demonstrated" (Klonsky et al., 1996).

BIOS has been encouraging growers to look at the cost of chemical applications in terms of the economic return from the crop. BIOS growers may show more damage at harvest than conventional growers, but much less is spent on sprays and their application. Disease pressure may also be reduced by eliminating or reducing synthetic fertilizers. BIOS growers have been successful in adopting a "whole systems" approach which is supported by standard tools as well as some new ones. This approach is a healthy one which reduces the use of pesticides and synthetic nitrogen and lowers disease pressure over the long term.

Several of the enrolled growers commented on the usefulness of monitoring techniques. "I've learned more precise monitoring techniques for scale and mites," commented one grower. Another indicated that he now monitors weekly, and yet another said, "I'm in the orchard more and I've learned to look for beneficials as well as pests." These comments support the BIOS goal of educational forums and on-site technical assistance to help growers make informed decisions about their management options. Growers in the program are learning to make their decisions based on monitoring or knowing their own orchard rather than using the calendar approach.

Figure 4

Sources of Support



2. BIOS Publications

BIOS *Field Notes* is a publication which comes out monthly during the active growing season. *Field Notes* provides current information about orchard conditions. One of its main purposes is to assist growers with orchard monitoring and pest management decision making. All growers who responded indicated that they read the *Field Notes* publication, usually within a few days of receiving it. The majority of growers responding to this question (70%) ranked the *Field Notes* as a 3 or above (useful to very useful). Most growers (75%) read them to find out what was happening in other BIOS growers' orchards. 60% of respondents stated they used the Field Notes for general information or to learn more about BIOS management practices.

The BIOS Update publication is the quarterly newsletter for the BIOS Program, providing updates for both the walnut and the almond projects. This publication was also widely read, with 100% of respondents indicating that they read it. Some read only the section on their geographic area, but most read the project summaries from all regions as well as the update section on overall program direction.

management team when he became concerned about the volume of biomass his cover crop had created. The management team member came to the orchard for a visit, and assured the grower that the cover crop was rich with diversity and would help out-compete less desirable weeds, add nitrogen and provide habitat for beneficial insects. He also explained that the cover crop was manageable and would allow the grower to have a clean floor at harvest. They discussed mowing strategies and mowing timing to ensure there would be no conflict at harvest. This meeting made the grower more comfortable about his orchard's conditions and grateful to the management team member for the support and information. BIOS will encourage management team members as well as BIOS Project Coordinators to stay in touch with program participants in 1997.

2. Continue to emphasize the economic effects of the BIOS Program.

Farmers are interested in the bottom line. They want to know the economic impacts of the management decisions they make on their farms. BIOS will continue to support their management practices with sound economic data. There is UC research currently underway which is examining the cost effectiveness of BIOS practices versus more conventional ones. Documentation of economic information will be ongoing, and we will disseminate information to BIOS growers as information becomes available.

3. Continue to educate growers about the use of chemicals that are less disruptive and less polluting.

From the survey process, it became evident that growers need more information about the pesticide and herbicide choices they are making. Providing growers with information from DPR and the EPA will help growers distinguish which chemicals have the most potential to harm either the orchard beneficial population or the soil, air and water quality. We will develop a list of options or alternative practices.

4. BIOS growers want to know what is going on in other BIOS orchards.

Farmer to farmer communication is one of the most important aspects of the BIOS Program. Keeping farmers connected to each other, satisfying their need for information, and helping them to share their orchard practices and results are key elements for the success of the BIOS Program. A continuing goal is to find effective ways to implement these ideas. Growers are a good source of ideas, and the BIOS Program will continue to expand its network of grower communications, meetings, and published materials, to help growers get the information they need. They will continue to share this information and seek support from agricultural researchers and businesses.

5. Providing more information on shredding (chipping) orchard prunings.

An increasing number of growers are interested in information about shredding their orchard prunings. Many are afraid to shred due to warnings from their processor that shredding creates too much residue. Some processors will not accept nuts from orchards that have excessive shredded material. BIOS field days that have included information on shredding/chipping have been well attended and growers have indicated that learning about shredding, shredding equipment and other grower's chipping and shredding experiences are very important. BIOS will continue to present field days on shredding and make the most current information available to all interested growers.

Late Spring 1997
Volume 6

BIOS update

Newsletter of the Biologically Integrated Orchard Systems Program
A project of the Community Alliance with Family Farmers

CAFF Showcases Walnut Orchards on Fourth Annual BIOS Farm Tour

On the 2nd of May, 70 people gathered together for a day-long tour of BIOS walnut orchards. Event participants included legislators, program funders and members of the press. Among the dignitaries attending the tour was local Assemblymember Helen Thompson. CAFF's Walnut BIOS Project is now in its third season, with 20 growers who have 500 acres of walnuts enrolled as demonstration sites in Yolo and Solano Counties. The goal of the tour was to showcase the BIOS program as a successful model for reducing the use of synthetic pesticides and fertilizers by promoting the adoption of a biologically based approach to farming.

Tour participants started the day at the orchard of Martin Mariani, who is part of the family-owned Mariani Nut Company in Winters. Martin explained that the multi-species cover crop in his BIOS block has helped with erosion control and water penetration, and has added organic matter and nutrients to the soil. He enrolled 15 acres in the BIOS program in 1994 because he was interested in exploring more "environmentally friendly" farming practices. He explained that recently some of his company's overseas buyers have shown great interest in products grown using a more biological approach.

At Craig McNamara's Sierra Orchards, also in Winters, Craig explained that he relies on his vetch cover crop to provide half the yearly nitrogen requirement in his conventionally farmed walnut orchards. Next, Mark and Dennis Mariani demonstrated a chipper that shredded a huge pile of orchard prunings in a matter of minutes. Mark Mariani explained that the chips would be transported and sold to a biomass plant in Woodland, where they would be converted to energy. When he mentioned a state assembly bill that would offer incentive payments to those who haul chipped orchard prunings, he was pleasantly surprised to find the author of the bill among the tour attendees. Also at this site some people took a closer look at the cover crop and its benefits with Management Team member Fred Thomas. Others learned more about biological pest control from UC IPM Entomologist Walt Bentley and from George Post of Agricultural Advisors Inc.

(Continued on back page)

Welcomes and Farewells

Mike Spezia has moved on from his role as BIOS Program Coordinator. We thank him for his nearly two years of hard work and dedication to the BIOS Program. We wish him all the best in his future endeavors.

On April 28, Kerry Washinko joined the CAFF staff as the BIOS Almond Project Coordinator for Madera County. Kerry has worked with Central Valley growers for the past 12 years, most recently with valley vegetable growers as a Product Development Representative for Rogers Seed Co. Before this, she worked as a PCA for Bio Ag Services, releasing predatory and parasitic insects in orchards and vineyards. Kerry earned a B.S. degree in Agronomy from Colorado State University in 1981, and a M.P.S. degree in Agriculture from Cornell University in 1984. She is enthusiastic about her new position and is looking forward to meeting the BIOS participants in her territory.

Almo
Merced, Stanis
Colusa, Madi
San Joaquin Co
Solano and
Co

BIOS Staff

Jill Klein - Associate Director of Agriculture Programs Ext. 11

Marie Cady - Merced, Stanislaus Counties Almond Coordinator Ext. 20

John Knettle - Colusa, San Joaquin Counties Almond Coordinator Ext. 30

Kerry Washinko - Madera County Almond Coordinator 209-227-3997

Karminder Aulakh - Yolo & Solano Counties Walnut Coordinator Ext. 23

Marcia Gibbs - Research and Documentation Coordinator. Ext. 29

Liza Lewis - Monitoring Information Coordinator Ext. 29

Deanna Simon - Walnut Field Scout Ext. 29

Carla Campbell - BIOS Program Administrator Ext. 15

BIOS ALMOND PROJECTS

Merced & Stanislaus Counties

Mark Cady, Project Coordinator

One of the basic ideas promoted by CAFF's BIOS program is soil building to promote healthy, resilient trees resistant to pests and disease. The idea is to work from the ground up to bring the system into balance for the long-term stability of nut production without over-reliance on agricultural chemicals. This view was reflected in the presentations at the January BIOS Soil Biology meeting at the UCCE office in Modesto.

Tom Yamashita of Sunburst Labs in Turlock presented data he has collected from many agricultural systems. Results indicate that crops grown on soils with reduced soil organic matter and microbial diversity are relatively prone to disease.

Kate Scow, UC Davis, described the organisms and the ecological relationships present in the soil as populations become more diverse and the soil food web becomes increasingly complex. These populations regulate the availability of nutrients and the physical condition of the soil. A diverse soil microbe population is dependent on the availability of organic matter such as cover crops, compost and brush chips.

In order to assure a long-term presence of BIOS in Merced County, the East Merced Resource Conservation District (RCD) has hired Christi Hansard to take on the coordination of the BIOS program. Members of the CAFF BIOS staff are serving as her mentors so that we can build a new kind of BIOS program that is locally run and meets the changing needs of agriculture. If you want more information, or would like to get involved, give Christi a call at (209) 723-3714.

Colusa County

John Knettle, Project Coordinator

On March 10, BIOS grower Clay Shannon hosted a Compost, Cover Crops, and Beneficial Insect Releases Field Day in Arbuckle. Clay explained the benefits of the compost he applies to his orchards. Panel discussions with field day participants covered creating beneficial insect habitats, increasing earthworm activity, water infiltration, and cover crop maintenance. Finally, Roney Gutierrez gave an update on the Resource Conservation District Sand and Salt Creek Watershed Project.

Irrigation System Evaluation was the theme for the April 8 Field Day hosted by Gil Ramos. Presentations were made by Andy Geyer of Alsco and Mike Smith of Soils Solution Corporation. They were joined by local growers, UC Davis irrigation specialist Larry Schwankl, Resource Conservation District project manager Roney Gutierrez, and the BIOS Management Team in a discussion on irrigation systems for Colusa County orchards. Roney can be reached for EQIP cost-share information at the Colusa NRCS Field Office -telephone: (916)458-2931.

In May and June the BIOS Management Team is conducting visits to farms of enrolled growers as well as and growers interested in enrolling in the program.

Colusa county almond growers interested in learning more about BIOS can contact John Knettle at 756-8518 extension 20.

San Joaquin County

John Knettle, Project Coordinator

The BIOS Management Team welcomes growers Quentin and Jean Wright, Charles Harris, Cliff Van Till, and Larry Woltjen, who have recently enrolled in the San Joaquin BIOS project.

Thanks to Paul and Trish Tremayne of Ripon, for hosting the March 26 and April 22 Field Days. These events provided an opportunity for people to observe the Tremayne's cover crop at two different stages of maturity.

Spring Orchard Management was the theme at the March 26 Field Day. Steve Foiada, PCA and BIOS Management Team member, explained this year's BIOS field monitoring program. Steve Matthiasson, Four Seasons Ag Consulting, discussed pest monitoring in orchards. Almond grower and Stanislaus County BIOS Management Team member Ray Eck explained cover crop mowing strategies. Fred Thomas and grower John Lagier joined Ray in fielding visitor's questions on cover crops.

Other presentations were given by Terry Pritchard of UCCE on irrigation maintenance and scheduling, Tom Hoffman on owl boxes and gopher control, Cindy Lashbrook of Four Seasons Ag Consulting on insect identification and population management, and Fred Thomas on cover crop identification.

In May and June, the BIOS Management Team will be conducting orchard visits to enrolled growers. They will also visit with growers who are considering enrolling in the program.

Madera County

Kerry Washinko, Project Coordinator

On April 28, the Management Team held a grower meeting for BIOS almond growers in Madera and Fresno Counties. We discussed what growers can expect from the BIOS program and, in turn, what the program expects from member growers. Suggestions were made to improve field days by shortening the length of the presentations and the overall length of the program. We also discussed different ways to communicate information between growers in the program.

A field day is scheduled for June 18. The meeting will be hosted by Fritz Helzer, S & J Farms, who will demonstrate cover crop mowing. Other anticipated topics include spider mites and beneficials, ant control options, fertility and tissue analysis, and a speaker from the local Resource Conservation District. Spring/summer farm visits to enrolled growers are scheduled for May 13 and 14.

The mission of BIOS, a program of the Community Alliance with Family Farmers (CAFF), is to build a community of farmers, other agricultural professionals, and public institutions dedicated to the voluntary adoption of a whole systems approach to farm management that is flexible, maintains long term profitability, and relies less on chemical inputs.

One of the objectives of the Madera BIOS program this year is to increase enrollment. We are hoping to recruit 10 new growers by cover crop planting time in the Fall. If you have any suggestions or contacts, please contact Kerry at (209) 227-3997.

BIOS WALNUT PROJECT

Karminder Aulakh, Project Coordinator

Over 35 growers and PCAs attended the February Pest Management workshop, which featured presentations on walnut blight, alternative methods for control of codling moth, and presentation of the 1996 Year-End Monitoring report by CAFF's Liza Lewis. The highlight of the meeting was a discussion based on the experience of several BIOS growers who have released parasitic wasps and used pheromone confusion to control codling moth in their orchards. Meeting participants also purchased owl, kestrel and bluebird nest boxes built by the Esparto High School woodshop class.

In March the Management Team visited 18 out of 20 BIOS orchards to discuss cover crop mowing and management, fertility programs, and pest management strategies with growers and their PCAs. While several BIOS growers had excellent cover crops this Spring, most experienced disappointing stands compared to last year. Explanations for the poor performance of legumes ranged from slugs to flooded soils to poor germination. Thus, many of the visits focused on how to best manage the existing vegetative cover for benefits such as infiltration, summer weed suppression, organic matter, and habitat for beneficials.

In April, 25 enrolled growers, Management Team members, and CAFF staff toured Suchan Nursery in Lake County. Owner and walnut grower Alex Suchan shared a wealth of knowledge and experience with his visitors. He covered planting of seeds and seedlings, grafting, cover crop trials, mulching of leaves for weed control, the relationship between methyl bromide and crown gall, and more. About the only thing Alex didn't explain to the group was how to tell Paradox hybrid rootstock from California black walnut. For a copy of the notes from this tour, contact Karminder at the CAFF office. Also, see the article on Alex's approach to planting and grafting walnut seedlings in the May 1997 issue of *Pacific Nut Producer*.

The Fourth Annual BIOS Farm Tour, held on May 2, featured the BIOS Walnut Project for the first time. For an account of the tour, see page cover page.

MONITORING

Survey and Evaluation Data

Marcia Gibbs, Research & Documentation Coordinator

The 1996 year-end grower surveys are now completed with almost 100% returns. Many thanks to the growers for taking the time to complete this important survey. A full report on the survey and program evaluation results will be out in early June.

Thanks are also due to those BIOS growers who completed a program evaluation.

A preliminary analysis of the 1996 survey and evaluations shows that:

- 90% of all participating walnut growers applied no insecticides and had little insect damage at harvest. Insect damage averaged 2.2% in a harvest crackout conducted by BIOS before nuts went to the processors.
- Over 80% of BIOS walnut growers used the monitoring information provided by the BIOS Field Scout to help them make pest and fertility management decisions.
- Less than 10% of all BIOS almond growers used a dormant spray in the 1996 season and most growers have successfully eliminated the use of organophosphate sprays.
- About half of all BIOS almond growers have eliminated or reduced the use of herbicides since joining the BIOS program.
- 90% of all BIOS participants who completed a program evaluation felt they received the technical support they needed to implement BIOS practices. Field days were by far the biggest source of this support, with the *Field Notes* Publication and Management Team support following close behind.

More on monitoring for the Spring

Liza Lewis, Monitoring Information Coordinator

In addition to the monitoring conducted by growers and PCA's, Steve Foiada from the San Joaquin County project has teamed up with CAFF to provide thorough weekly monitoring for the eight currently enrolled growers. These results will be published in the monthly Field Notes and summarized in a year-end report. Data from UC IPM Regional Entomologist Walt Bentley's specialized monitoring program in Merced and Stanislaus will also be included in these mailings. Walt is continuing his on-farm comparison study of BIOS and Non-BIOS blocks even though the Almond Board was unable to continue funding for 1997.

The value of standardized data collection pooled together from a group of orchards was evident in our comprehensive 1996 Monitoring Program Report recently completed for the walnut project. With a full-time walnut Field Scout, we provided participating growers with site specific information which helped them improve their pest, fertility and cover crop management. We also established baseline information on relative pest pressures for each orchard. The Walnut Field Scout continues to monitor all 20 enrolled orchards this season.

If you have questions or would like copies of *Field Notes* or the 1996 Monitoring Program Report or Field Notes please give Liza Lewis a call at : (916)756-8518 extension 29.

BIOS for Almonds Guide Available

The guide is based on the experiences of growers, PCA's, and researchers. The cost is $7.00 plus $3.00 shipping (free to all enrolled BIOS growers and their PCA's). You can pick up a copy at BIOS field days, or call Carla at the CAFF office (916)756-8518 extension 15.

Almond Grower Recruitment: The Management Team and CAFF staff are recruiting growers and PCAs for Colusa, Madera and San Joaquin counties. If you are interested in signing up or know of someone who would be a good candidate, please contact John Knettle at (916) 756-8518. For Madera, please contact Kerry Washinko at (209) 227-3997.

If you are not reading the BIOS Update and do not want to continue receiving it, please contact Carla at the CAFF office (916) 756-8518 and we'll take you off of our database.

BIOS Biologically Integrated Orchard Systems

Community Alliance with Family Farmers
P.O. Box 363
Davis, CA 95617
Address Correction Requested

(Continued from front page)

The final stop of the day was Russell Lester's Dixon Ridge Farms, where lunch speakers discussed the adoption of BIOS-style practices for different crops in the state. Cliff Ohmart, Lodi-Woodbridge Winegrape Commission's Biologically Integrated Farming Systems (BIFS) Coordinator talked about the success of this project, which was funded through legislation introduced by CAFF. Jean-Mari Peltier, Department of Pesticide Regulations, described her agency's program, which funds similar projects in cotton, vines, and prunes.

A tour through Russ's organic walnut orchard highlighted cover crop mowing, compost spreading, use of remnant strips and insectary shrubs for beneficial insect habitat, a different method of brush chipping, and recycling of irrigation water through tailwater return ponds. Robert Bugg, UC SAREP, introduced the group to several species of earthworms found in the biologically active soils of Russ's orchard. Russ's daughter Jenny, a Winters High School junior, wrapped things up with a presentation of her F.A.R.M.S. project research on native grass plantings to attract beneficial insects. F.A.R.M.S. is a collaborative project that brings high school students from five counties to Sierra Orchards to learn hands-on about agriculture and science.

This project has been funded in part by the United States Environmental Protection Agency Assistance Agreement No. [illegible] and the State Water Resources Control Board under Contract No. [illegible]. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency or the State Water Resources Control Board nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

UPCOMING ALMOND EVENTS

Colusa County: *Wednesday, May 28, 9 - 1 pm, 6766 Harrington Road.* Topics: Improving cover crop habitat to promote beneficial insects, rainfall simulation tests for ground cover and water infiltration, mowing, cover crop regeneration, insect identification.
Contact John Knettle (916) 756-8518 for more information.

San Joaquin County: *Tuesday, June 1, 8:30-11:30 am, Ripon Firehouse.* Topics: Spray timing, Dipel for PTB, *Goniozus*, floor management.
Contact John Knettle (916) 756-8518 for more information.

Colusa County: *Tuesday, June 17, 9 am-1 pm, location and topics TBA.*
Contact John Knettle (916) 756-8518 for more information.

Madera County: *Wednesday, June 18, 9 -Noon, S & J Ranch, 9151 S. Minturn Road, Chowchilla.* Topics: Spider mites, fertility and tissue analysis, ant control, cover crop mowing demonstration.
Contact Kerry Washinko (209) 227-3997 for more information.

San Joaquin County: *Wednesday, July 13,* location and time TBA.
Contact John Knettle (916) 756-8518 for more information.

UPCOMING WALNUT EVENTS

Yolo & Solano Counties: *Wednesday, June 4, 8:30 - 11:30 am, call for directions.* Topics: biological control of mites, beneficial insects in hedgerows, cover crops, and insect identification.
Contact Karminder Aulakh (916) 756-8518 for more information.

THE CALIFORNIA INSTITUTE FOR RURAL STUDIES

221 G Street, Ste. 204 Davis, CA 95616 • Mailing Address: PO Box 2143 Davis, CA 95617
Phone: (916) 756-6555 • Fax: (916) 756-7429

July 24, 1997

TO: Marcia Gibbs
Jill Klein
CAFF

FROM: Don Villarejo

RE: CALFED Proposal

Here are our thoughts on costs for the work and costs to track reported pesticide use data for the CAFF BIOS almond project. It is based on current costs for purchasing data files and our staff time for updating, supervision and data analysis. The counties to be included are: Colusa, Madera, Merced, San Joaquin and Stanislaus. The total number of growers is estimated to be 90, based on your estimate of 40 for the Colusa, Madera and San Joaquin program, and 51 for the Merced and Stanislaus program.

CIRS will prepare a written narrative report on pesticide use in blocks of almond orchards, as specified by CAFF staff, including, but not limited to, diazanon, supracide and organophosphates. The annual total cost is:

Total Cost	$32,000
Total hours	842
Hourly rate	$38

The time-line for completion of each phase of the project depends upon the availability of public record pesticide use report (PUR) data provided by the individual counties. 1996 PUR data was made available by the majority of the counties of interest on May 1, 1997. Under the assumption that a similar time frame would apply each year, then the proposed CIRS time-line would be, for 1998 (and corresponding dates for subsequent years):

January - March 1998, update 1997 county permit records
May - July 1998, update 1997 PURs

Budget justification

County updates	
Staff time	
Executive Director	
25% for three months @ $40,000 FTE	$2,500
Research Associate	
12 weeks on full-time @ $29,250 FTE	7,312
Computer Consultant	
25 hrs @ $36/hr.	900
Fringe benefits, 20.48% of Salaries	2,914
Data Purchase	
Five counties - CS, MA, MC, SJ, ST	800
Pesticide Use Reports	
Staff time	
Executive Director	
33% for three months @ $40,000	$3,300
Computer Consultant	
180 hrs. @ $36 per hour	$6,480
Fringe benefits, 20.48% of salaries	2,003
Data Purchase	
Annual pesticide use report data files (6 counties)	1,040
D-M Information Systems	
Data Conversion	540
Sub-total, direct costs	$27,250
Indirect costs, 17.5% of Direct Costs	4,750
Total project costs	$32,000

I-006318